

PSEUDOGNAPHALIUM CANESCENS (ASTERACEAE:
GNAPHALIEAE) AND PUTATIVE RELATIVES
IN WESTERN NORTH AMERICA

Guy L. Nesom

Botanical Research Institute of Texas
509 Pecan Street
Fort Worth, Texas 76102-4060, U.S.A.

ABSTRACT

Pseudognaphalium canescens, *Pseudognaphalium microcephalum*, *Pseudognaphalium beneolens*, and ***Pseudognaphalium thermale*** (E.E. Nelson) Nesom, comb. nov., are treated as separate species. A recent treatment of the California flora combined these taxa as subspecies within a single species (*P. canescens*) but earlier floristicians have viewed them as distinct species. The current study also concludes that they are distinct and appropriately treated at specific rank. A nomenclatural and ecological summary and a distribution map are provided for each species and the four are morphologically distinguished in a key. A lectotype is designated for *Gnaphalium wrightii*.

RESUMEN

Pseudognaphalium canescens, *Pseudognaphalium microcephalum*, *Pseudognaphalium beneolens*, y ***Pseudognaphalium thermale*** (E.E. Nelson) Nesom, comb. nov., se tratan como especies independientes. Un reciente tratamiento de la flora de California combinaba estos taxa como subspecies dentro de una única especie (*P. canescens*) pero los floristas previos las han visto como especies distintas. El presente estudio también concluye que son distintas y que lo apropiado es tratarlas a nivel específico. Se ofrece un resumen nomenclatural y ecológico, así como un mapa de distribución de cada especie, y se distinguen morfológicamente las cuatro en una clave. Se designa un lectotipo para *Gnaphalium wrightii*.

For the forthcoming treatment of *Pseudognaphalium* in the Flora of North America, I will recognize as species four taxa that were recently treated (Stebbins & Keil 1992; Stebbins 1993) as subspecies of a single species: *P. canescens* (DC.) A. Anderb., *P. microcephalum* (Nutt.) A. Anderb., *P. beneolens* (Davidson) A. Anderb., and (as validated below) *P. thermale* (E.E. Nelson) Nesom.

Pseudognaphalium thermale (E.E. Nelson) Nesom, comb. nov. *Gnaphalium thermale* E.E. Nelson, Bot. Gaz. 30:121. 1900. *Gnaphalium microcephalum* var. *thermale* (E.E. Nelson) Cronq., Leaflet West. Bot. 6:47. 1950. *Gnaphalium microcephalum* subsp. *thermale* (E.E. Nelson) G.W. Douglas, Canad. J. Bot. 64:2726. 1986. *Gnaphalium canescens* subsp. *thermale* (E.E. Nelson) Stebbins & Keil, Novon 2:437. 1992. *Pseudognaphalium canescens* subsp. *thermale* (E.E. Nelson) Kartesz, Syn. Checklist & Atlas, Nom. Innov. 1999. *Pseudognaphalium microcephalum* (Nutt.) Anderb. var. *thermale* (E. Nelson) Dorn, Vasc. Pl. Wyoming, ed. 3. 375. 2001. TYPE: U.S.A. WYOMING. [Park Co.], Yellowstone Park, geyser formations of Norris geyser basin, 25 Jul 1899, A. Nelson and E. Nelson 6139 (HOLOTYPE: RM, ISOTYPES: GH!, US!).

Gnaphalium williamsii Rydb., Bull. Torrey Bot. Club 37:324. 1910. TYPE: U.S.A. MONTANA. [Flat-head Co.], Columbia Falls, 11 Aug 1894, R.S. Williams s.n. (HOLOTYPE: NY!).

Gnaphalium johnstonii G.N. Jones, Univ. Wash. Publ. Bot. 7:159, 176. 1938. TYPE: U.S.A. WASHINGTON, [Thurston Co.]: upper valley of the Nesqually, open, barren ground. 15 Sep 1896. O.D. Allen 223 (ISOTYPE [as so annotated?]: WTU, digital image!).

Flowering Jun-Sep(-Oct). Dry, sandy roadbanks, roadside ditches, river beds and banks, lakeshores, granitic sand, open woods of yellow pine, Jeffrey pine, red fir, Douglas fir, mixed conifer, and mixed evergreen; (50-)300-2300(-2500) m. British Columbia; California, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming.

Pseudognaphalium beneolens (Davidson) A. Anderb., Opera Bot. 104:147. 1991. *Gnaphalium canescens* subsp. *beneolens* (Davidson) Stebbins & Keil, Novon 2:437. 1992. *Pseudognaphalium canescens* subsp. *beneolens* (Davidson) Kartesz, Syn. Checklist & Atlas, Nom. Innov. 1999. *Gnaphalium beneolens* Davidson, Bull. S. Calif. Acad. Sci. 17:17. 1918. TYPE: U.S.A. CALIFORNIA, [Los Angeles Co.]: Crescenta, 1 Sep 1917. F.E. Burlew 3275 (ISOTYPE: GH!).

Flowering (Apr-)Jun-Oct. Dry, open slopes and ridges, river beds, roadbanks and other disturbed sites, sandy flats, dunes, coastal sage scrub, chaparral, yellow pine, foothill pine, blue oak woodland; (1-)50-850(-1950) m. California; Mexico (Baja California).

Pseudognaphalium microcephalum (Nutt.) A. Anderb., Opera Bot. 104:147. 1991. *Gnaphalium microcephalum* Nutt., Trans. Amer. Philos. Soc. ser. 2, 7:404. 1841. *Gnaphalium canescens* subsp. *microcephalum* (Nutt.) Stebbins & Keil, Novon 2:437. 1992. *Pseudognaphalium canescens* subsp. *microcephalum* (Nutt.) Kartesz, Syn. Checklist & Atlas, Nom. Innov. 1999. TYPE: U.S.A. CALIFORNIA, [San Diego Co.]: San Diego, [April or early May], 1836, T. Nuttall s.n. (BM, photo-GH!). After examining a photo of the type of *Gnaphalium microcephalum*, Johnston (1924) noted that *G. microcephalum* was correctly applied to the species usually called *Gnaphalium bicolor* Bioletti (= *Pseudognaphalium biolettii* A. Anderb.); he then proposed *Gnaphalium albidum* to account for the species left without a name. The present interpretation, however, of the type and of Nuttall's description is that they refer to *P. microcephalum* in the concept here (see key below). Ferris (1960, p. 469) examined the photograph of the type and her interpretation of its identity was similar to that here. She commented that "The specimen probably was collected in the spring (see Madrono 2:146-47. 1934) [Jepson 1934]. This would account for the weather-beaten appearance (darkened foliage and rubbed tomentum) of this plant which normally flowers in summer and early fall."

Gnaphalium albidum I.M. Johnston, Contr. Gray Herb. 70:84. 1924. TYPE: U.S.A. CALIFORNIA, San Diego Co.: Granite, in chaparral, 1850 ft. 11 Jul 1916, M.F. Spencer 69 (HOLOTYPE: GH!; ISOTYPE: US!).

Flowering (Apr-)Jun-Aug(-Nov). Grassy hillsides, gravelly canyon bottoms, coastal sage scrub, chaparral; 50-900(-1800) m. California; Mexico (Baja California).

Pseudognaphalium canescens (DC.) A. Anderb., Opera Bot. 104:147. 1991 (non W.A. Weber 1991). *Gnaphalium canescens* DC., Prodr. 6:228. 1838. TYPE: MEXICO, GUANAJUATO: León, Méndez s.n. (HOLOTYPE: G-DC, fiche!, photos F! and TEX!).

Gnaphalium wrightii A. Gray, Proc. Amer. Acad. Arts 17:214. 1882. <b7,10>TYPE: U.S.A. TEXAS, [El Paso or Hudspeth Co.]: valley between El Paso and the Guadalupe Mts., Oct. [1849], C. Wright

394 (LECTOTYPE, designated here: GH[†]; ISOLECTOTYPES: GH, US). Gray's protologue referred to three collections: he directly cited (1) *Parry & Palmer 419* (GH) from San Luis Potosí, Mexico, collected in 1878; he cited "*G. microcephalum*, Gray, Pl. Wright, i. & ii., non Nutt." in reference to his earlier identification as *Gnaphalium microcephalum* of (2) a collection by Wright in Texas from the "Valley between El Paso and the Guadalupe Mts.; Oct." (Pl. Wright. [Smithsonian Contr. Knowl. 3(5) 1852] 1:124. 1852) and (3) another collection by Wright in 1851 from New Mexico, "from mountains near the copper mines" (Pl. Wright. [Smithsonian Contr. Knowl. 5(6) 1853] 2:99. 1853).

Gnaphalium albatum Osterh., *Muhlenbergia* 1:141. 1906. TYPE: U.S.A. COLORADO. Larimer Co.: Canyon of Thompson River, 16 Aug 1905, G.E. Osterhout 3158 (ISOTYPE [as annotated by C. Anderson, 1972] NY!).

Gnaphalium sonorae I.M. Johnston, Contr. Gray Herb. 68:99. 1923. TYPE: MEXICO. SONORA: Hermosillo, 1888, M.A. Crawford s.n. (HOLOTYPE: GH[†]; ISOTYPE: US).

Gnaphalium viridulum I.M. Johnston, Contr. Gray Herb. 70:86. 1924. TYPE: U.S.A. NEW MEXICO. [Grant Co.]: Bear Mts. near Silver City, 2400 m, 19 Sep 1903, O.B. Metcalfe 742 (HOLOTYPE: GH[†]; ISOTYPE: US).

Gnaphalium texanum I.M. Johnston, Contr. Gray Herb. 70:86. 1924. TYPE: U.S.A. TEXAS. [Brewster Co.]: mouth of "Tarlingua" [Terlingua Creek], Sep 1883, V. Havard 26 (HOLOTYPE: GH[†]; ISOTYPE: US).

Flowering Aug–Nov (–Jan). Lava beds, grasslands, oak, pine-oak, and pine woodlands, 1150–2450 (–2700) m; Arizona, California, Colorado, New Mexico, Oklahoma, Texas, Utah; Mexico (Baja California, Chihuahua, Coahuila, Durango, Nuevo León, San Luis Potosí, Sinaloa, Sonora, and other states to the south).

KEY TO PSEUDOGNAPHALIMUM CANESCENS AND PUTATIVE RELATIVES IN CALIFORNIA

1. Basal and lower cauline 1.5–6 mm wide, similarly colored on abaxial and adaxial surfaces, cauline decurrent 5–14 mm, the decurrent portion appearing as a thin line, densely and prominently sessile-glandular beneath the tomentum; plants aromatic.
 2. Stems 20–40 cm tall; basal and lower cauline leaves narrowly oblanceolate, gradually or abruptly reduced in size and becoming linear upwards, not coiling upon wilting; capitulescence corymbiform; involucre 4–5 mm long; phyllaries in 3–4 (–5) series, usually slightly hyaline and shiny; bisexual florets (2–)4–7; habitats at (600–)900–2500 m _____ ***Pseudognaphalium thermale***
 2. Stems 35–100 cm tall; basal and lower cauline leaves linear to linear-ob lanceolate, relatively even in size and shape upwards, usually twisting or broadly coiling upon wilting; capitulescence usually elongate-paniculiform; involucre 5–6 mm long; phyllaries in (4–)5–6 (–7) series, usually opaque and dull; bisexual florets (3–)5–10 (–13); habitats at 5–800 (–1550) m _____ ***Pseudognaphalium beneolens***
1. Basal and lower cauline leaves (2–)5–10 (–15) mm wide, often weakly bicolored, cauline not decurrent, eglandular (*P. microcephalum*) or eglandular to minutely and inconspicuously sessile-glandular (*P. canescens*); plants not aromatic.
 3. Stems 50–100 cm tall, usually 3–5 mm diameter near the base; leaves eglandular; phyllaries in 4–5 series, outer ovate; bisexual florets 4–9 _____ ***Pseudognaphalium microcephalum***
 3. Stems 20–70 cm tall, usually 2–3 mm diameter near the base; leaves eglandular to minutely and inconspicuously sessile-glandular beneath the adaxial tomentum; phyllaries in 3–4 series, outer ovate-lanceolate; bisexual florets (1–)2–5 (–6), 4–6 more common in the USA _____ ***Pseudognaphalium canescens***

DISCUSSION

All four of the taxa considered here occur in California (Figs. 1–4). *Pseudognaphalium microcephalum* and *P. beneolens* are primarily Californian. *Pseudognaphalium canescens* ranges eastward to Colorado, Oklahoma, and Texas and southward in Mexico as far as Chiapas, although it appears to be rare south of the state of Mexico. *Pseudognaphalium thermale* occurs northward into southern British Columbia, Idaho, and Montana and barely reaches Utah and Wyoming. Stebbins and Keil (1992) observed that in southern California, where all four occur, they “intergrade to such a degree with respect to characters used in current keys (Ferris 1960; Munz 1959, 1968, 1974) to differentiate them — decurrent versus nondecurrent leaf bases, nature of tomentum, character of capitulescence, size and shape of heads, and acute versus obtuse phyllary tips — that they cannot be consistently be separated from each other.” Cronquist (1955) earlier treated *Gnaphalium thermale* and *G. microcephalum* at varietal rank within a single species, but his concept of the latter apparently included at least *G. beneolens*. In contrast, other botanists have regarded each of the four as a separate species (i.e., Ferris 1960; Munz 1959, 1968), and I also find that consistent separation is possible.

Local and regional floras in California have treated *Pseudognaphalium microcephalum* and *P. beneolens* as separate species where they occur together: San Luis Obispo Co. (Hoover 1970), “southern California” (Munz 1974), the Santa Monica Mountains of Los Angeles Co. (Raven et al. 1986), and Santa Cruz Island of Santa Barbara Co. (Junak et al. 1995). These two species are sympatric in the southern coastal counties (Figs. 2 and 3) and I have not seen collections that might be indicative of hybridization.

Pseudognaphalium beneolens and *P. thermale* are similar in their aromatic character and their relatively narrow, decurrent, concolored leaves prominently sessile-glandular beneath the other indument. The two are largely allopatric in geographic range (Figs. 3 and 4) and *P. beneolens* generally occurs at lower elevations. Ferris (1960, p. 470) noted that “some plants of the lower western slopes of the Sierra Nevada are intermediate between [*Gnaphalium beneolens*] and *G. thermale*, having the opaque phyllary-tips and larger heads of the former and the growth habit and shorter inflorescence of the latter.” My observation is that these plants (e.g., Tuolumne, Mariposa, and Fresno cos.), which I identify as *P. beneolens*, occur at higher elevations than coastal populations and they tend to have slightly wider basal leaves, but otherwise they fit within the species. In any case, even if they are somewhat differentiated from coastal populations, it is not clear that genes from *P. thermale* are the influencing factor. Further, there does not appear to be evidence of intergradation even in Mariposa and Fresno counties, where the two species apparently occur in relatively close proximity.

Pseudognaphalium beneolens was reported for Oregon by Ferris (1960) and

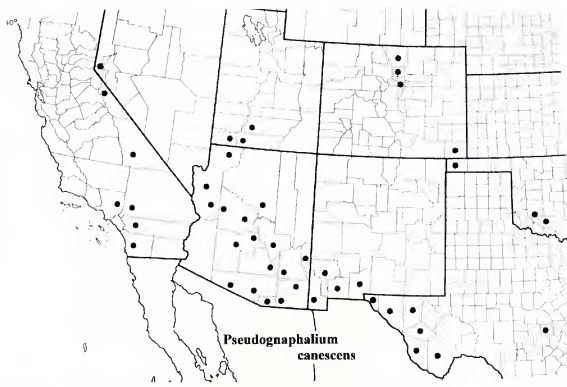


FIG. 1. Distribution of *Pseudognaphalium canescens* in the United States. The distribution continues into south-central Mexico (see text).

Munz (1974) and the current study records its occurrence in immediately adjacent California (Fig. 3), considerably north of the main range of the species. Both records are documented here: CALIFORNIA. Del Norte Co.: Hazelview Summit on Crescent City-Grant's Pass road, 2800 ft, 24 Jul 1928, Kildale 5813 (LL); OREGON. Josephine Co.: Illinois River between McGuire Gulch and Oak Flat, 1300 ft, 8 Aug 1929, Kildale 8881 (LL).

Pseudognaphalium canescens and *P. microcephalum* are mostly odorless and have relatively broader, non-decurrent, and weakly bicolored leaves without glands or with minute and weakly developed glands. These two species differ in geography and ecology and it is unlikely that they hybridize.

Variation in *Pseudognaphalium canescens*

Variability in phyllary morphology apparently was the primary basis for I.M. Johnston's descriptions of the several different taxa now treated within *Pseudognaphalium canescens*. Plants of *P. canescens* characteristically produce strongly white-opaque phyllaries with a filiform keel and apiculum, but in the southern portion of its range (Jalisco southeastward) and scattered localities elsewhere, the phyllaries may be more hyaline and lack a pronounced keel and apiculum. Similar plants from New Mexico were the basis for Johnston's recognition of *Gnaphalium viridulum*, but these are not distinct on the basis of other

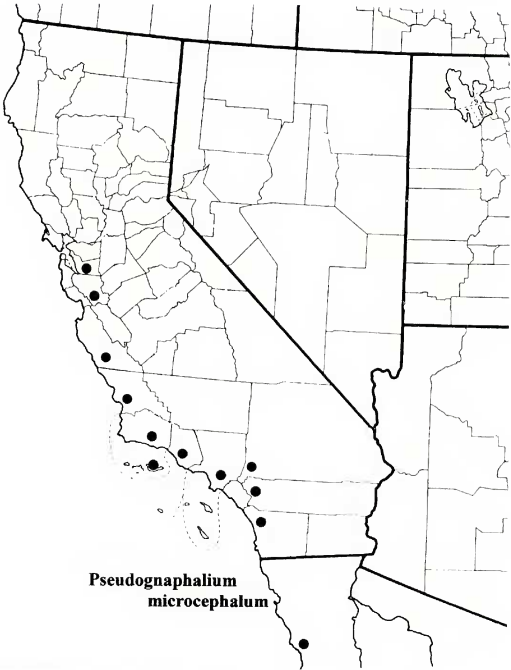


FIG. 2. Distribution of *Pseudognaphalium microcephalum*.

characters. The widely disjunct populations of *P. canescens* in Texas, Oklahoma, and Colorado (Fig. 1) do not appear to be significantly differentiated from those in areas where the species is more continuously distributed.

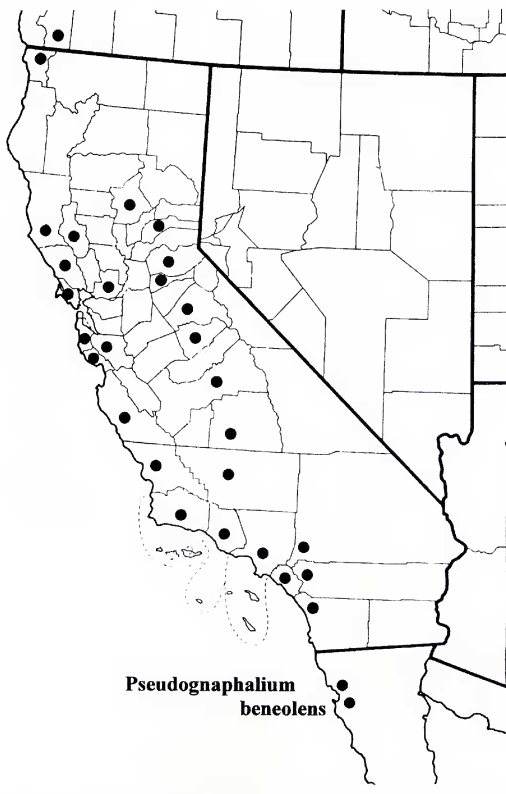


FIG. 3. Distribution of *Pseudognaphalium beneolens*.



FIG. 4. Distribution of *Pseudognaphalium thermale*. Some records were taken from databases available through herbaria of the University of British Columbia (UBC), Washington State University (WTU), and Oregon State University (OSU).

ACKNOWLEDGMENTS

David Giblin (WTU) provided data and a digital image of the type of *Gnaphalium johnstonii*, Scott Sundberg (OSU) helped in accessing the Oregon State University database of vascular plants, and Walter Kittredge (GH) provided information on the syntypes and typification of *Gnaphalium wrightii*. Observations and distribution maps are based on specimens from ARIZ, GH, HSC, MO, TEX/LL, and SMU/BRIT, except where noted for Fig. 4. Review comments from David Keil are much appreciated.

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